REMARKS

Claims 13-16, 18-21, 27-30 and 40-47 are pending in the application. Claims 13-16, 18-21, 27-30, and 40-47 are rejected. Claims 13-16, 18-21, 27-30, 45, and 47 were cancelled. Claims 40-44 and 46 were amended. Claims 48-59 were added. Claims 40-44, 46, and 48-59 remain in the application.

A quotation from U.S. Patent No. 5,047,955, which is incorporated by reference in the application, has been added to the specification.

Claims 13, 18, 27 and 45-47 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rourke (US Patent 5,995,721) in view of Barry (US Patent 5,596,416). The office action states:

> Regarding claim 13: Rourke discloses an image processing method implemented in a printing system (figure 2 and column 8, lines 16-25 of Rourke), the method comprising the steps of:
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> • providing rasterized color separated contone gray level image data (RIP Data) (column 6, lines 48-54 and column 9, lines 51-56 of Rourke).
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> • changing the RIP Data in accordance with an operators adjustments (figure 11(145) and column 12. lines 49-52 of Rourke), such that the changing of the RIP Data occurs while the printing system is parsing a print job, thereby resulting in a corresponding contemporaneous change in an appearance of the print job (figure 11(138,140) and column 12, lines 38-45 and lines 52-61 of Rourke).
>
> • subjecting the changed RIP Data to a halftone process to generate halftone rendered data (column 6, lines 48-54 and column 12, lines 34-37 of Rourke). Printers such as ink jet printers, laserjet printers. and digital copiers are used to print (column 6, lines 48-54 of Rourke) full color and pictoral image data (column 12, lines 34-37 of Rourke). Thus, halftone processing of the RIP Data to generate halftone rendered data is inherent-
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> • outputting the halftone rendered data, or a derivative thereof, for subsequent printing (column 13, lines 28-39 of Rourke).
>
> Rourke does not disclose expressly that the changing of the RIP Data occurs while the printing system is specifically printing a print job.
>
> Barry discloses that parsing, RIPing and printing occur in an overlapping manner (figure 6 and column 10. lines 18-38 of Barry). Thus, as soon as one page or group of pages is ready to print, the page or group of pages is printed while the page or group of pages to be printed afterwards is in the process of being parsed and RIPed.
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> Rourke and Barry are combinable because they are from the same field of endeavor, namely high-volume distributed printing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print the page or group of pages immediately after the operations necessary for preparation are completed, thus

performing the preparatory operations of later pages while the earlier pages are still in the process of actual printing, as taught by Barry. As applied to Rourke, the changing of the RIP Data would occur while the printing system is printing the print job since, as soon as the parsing and editing is performed for a prior page or group of pages, the pages would be printed while the next page or group of pages is being parsed and edited. The motivation for doing so would have been that overlapping the preparatory operations with the printing operations in a print job according to the teachings of Barry would increase the overall throughput of the printing system. This is clearly a desirable result for the system of Rourke. In fact, Rourke places the print data in the job to be edited initially in a RIPed format to facilitate a print-on-demand system (column 9, lines 46-56 of Rourke). Applying the teachings of Barry to Rourke further increases the speed and capacity of the print-on-demand system taught by Rourke. Therefore, it would have been obvious to combine Barry with Rourkc to obtain the invention as specified in claim 13.

The office action also states, in the Response to Arguments:

Barry (US Patent 5,596,416) has not been relied upon expressly to teach that the RIP data for a print job be changed while the print job is being printed. Rather, it is the combination of Rourke (US Patent 5.995.721) and Barry that teaches this feature. Rourke teaches changing the RIP Data in accordance with an operator's adjustments (figure 11(145) and column 12, lines 49-52 of Rourke), such that the changing of the RIP Data occurs while the printing system is parsing a print job, thereby resulting in a corresponding contemporaneous change in an appearance of the print job (figure 11(138.140) and column 12, lines 38-45 and lines 52-61 of Rourke). Barry teaches that parsing, RIPing and printing occur in an overlapping manner (figure 6 and column 10, lines 18-38 of Barry). Thus, as soon as one page or group of pages is ready to print, the page or group of pages is printed while the page or group of pages to be printed afterwards is in the process of being parsed and RIPed. As explained in the arguments regarding claim 13, both below and in the previous office action, Barry teaches printing the page or group of pages immediately after the operations necessary for preparation are completed, thus performing the preparatory operations of later pages while the earlier pages are still in the process of actual printing. Thus, by applying the teachings of Barry to Rourke, the changing of the RIP Data would occur while the printing system is printing the print job since, as soon as the parsing and editing is performed for a prior page or group of pages, the pages would be printed while the next page or group of pages is being parsed and edited. Therefore, by combination, Rourke in view of Barry teaches that the RIP data for a print job is changed while the print job is being printed.

Claim 13 has been replaced by Claim 48, which states:

48. An image processing method implemented in a printing system, the method comprising the steps of:

rasterizing image data of a print job to provide one or more pages of rasterized image data;

storing said rasterized image data in a job image buffer;

outputting said rasterized image data from said job image buffer to provide output data;

changing said output data in accordance with an operator's adjustments;

halftoning said changed output data to provide halftone rendered data; and

printing said print job from said halftone rendered data;

wherein said changing is during said printing, thereby resulting in a corresponding contemporaneous change in appearance of said printed print job.

Claim 48 is supported by the application as filed, notably the original claims and at page 23, lines 12-23; page 2, lines 15-21; page 2, line 30 to page 3, line 4 and page 6, lines 5-11.

Claim 48 requires rasterizing a print job, storing the rasterized image data in a job image buffer, outputting the data from the buffer, changing said output data in accordance with an operator's adjustments, then halftoning and printing. The changing is during the printing of the print job. Rourke in view of Barry does not teach or suggest this combination of features.

Rourke indicates that a "current job master" is held in a buffer following RIPing to an intermediate format. (See items 94-96 in Rourke, Figure 8.) Images in the job can then be edited. (Rourke, col. 12, lines 49-52) Buffering of the RIPed job is required for editing.

> "Once the job is in a suitable intermediate format, it may be buffered (step 96) so that appropriate editing procedures, of the type alluded to below relative to the discussion of FIG. 11, can be executed therewith. (Rourke, col. 9, lines 57-61; emphasis added)

Updating of the "current job master" in the buffer is mandatory:

> "It will be appreciated that each time an editing operation is performed, revisions of the job copy buffered at the server (see e.g. step 98 of FIG. 8) must be updated appropriately." (Rourke, col. 12, lines 52-55; emphasis added; step 98 is not actually shown in FIG. 8 of the patent)

The job is then queued and printed, presumably using the updated job master. (Rourke, col. 10, lines 47-50; generally, see col. 9, line 34 to col. 10, line 50)

Claim 48, in contrast, requires that rasterized image data output from a buffer is changed, halftoned, and printed and that the changing is during the printing. In Rourke, data output from a buffer can be edited, but then edits go

back to the buffer to update the job copy in the buffer, rather than the output data proceeding to printing.

Barry teaches use of multiple print engine modules (PEMs). (Barry, Figure 1) Each PEM has a RIP that provides pixel output to an image buffer, which provides the output to a marking engine. (Barry, Figure 5; col. 9, lines 8-26) Assuming for the sake of argument that a combination of Barry with Rourke could be made and would provide for the use of multiple PEMs, such a combination would not alter the above-discussed features of Rourke and would teach no more than Rourke alone.

Claim 45 was cancelled.

As to Claim 18, the rejection stated:

> "Regarding claim 18: Rourke discloses a method of altering the appearance of an input digital image when printed (figure I 1 and column 12, lines 49-52 of Rourke), the method comprising the steps of
>
> "• rasterizing the input digital image into a rasterized image data (RID) (column 9, lines 51-56 of Rourke).
>
> "• separating the RID into separated rasterized contone gray level image data (column 6, lines 48-54 and column 9. lines 51-56 of Rourke). As is well-known in the art, when color image data, which is used in the color punters (column 9, lines 51-56 of Rourke). is RIPed (column 6, lines 48-54 of Rourke), the resultant RIP data is color separated according to the ink colors of the color printer that is to be used in printing.
>
> "• altering the separated rasterized contone gray level image data in accordance with an operator's adjustments (figure 11(145) and column 12, lines 49-52 of Rourke), such that the altering occurs while a print job is being parsed, thereby resulting in a corresponding contemporaneous change n an appearance of the print job (figure 11(138,140) and column 12, lines 38-45 and lines 52-61 of Rourke).
>
> "• subjecting the altered rasterized image data to a halftone process to generate halftone rendered data (column 6, lines 48-54 and column 12, lines 34-37 of Rourke). Printers such as ink jet printers. laserjet printers and digital copiers are used to print (column 6. lines 48-54 of Rourke) full color and pictoral image data (column 12, lines 34-37 of Rourke). Thus, halftone processing of the RIP Data to generate halftone rendered data is inherent.
>
> "• outputting the halftone rendered data or a derivative thereof, for subsequent printing (column 13, lines 28-39 of Rourke).
>
> "Rourke does not disclose expressly that the altering of the separated rasterized contone gray level image data occurs while the printing system is specifically printing a print job.
>
> "Barry discloses that parsing, RIPing and printing occur in an overlapping manner (figure 6 and column 10, lines 18-38 of Barry). Thus, as soon as one

page or group of pages is ready to print, the page or group of pages is printed while the page or group of pages to be printed afterwards is in the process of being parsed and RIPed.

"Rourke and Barry are combinable because they are from the same field of endeavor, namely high-volume distributed printing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print the page or group of pages immediately after the operations necessary for preparation are completed, thus performing the preparatory operations of later pages while the earlier pages are still in the process of actual printing, as taught by Barry. As applied to Rourke, the altering of the separated rasterized contone gray level image data would occur while the printing system is printing the print job since, as soon as the parsing and editing is performed for a prior page or group of pages, the pages would be printed while the next page or group of pages is being parsed and edited. The motivation for doing so would have been that overlapping the preparatory operations with the printing operations in a print job according to the teachings of Barry would increase the overall throughput of the printing system. This is clearly a desirable result for the system of Rourke. In fact, Rourke places the print data in the job to be edited initially in a RIPed format to facilitate a print-on-demand system (column 9. lines 46-56 of Rourke). Applying the teachings of Barry to Rourke further increases the speed and capacity of the print-on-demand system taught by Rourke. Therefore, it would have been obvious to combine Barry with Rourke to obtain the invention as specified in claim 18."

Claim 18 has been replaced by Claim 52, which states:

52. A method of altering the appearance of a print job when printed, the method comprising the steps of:

rasterizing image data of the print job into one or more pages of rasterized image data;

separating said rasterized image data into separated rasterized contone gray level image data;

storing said separated rasterized image data in a job image buffer;

producing each of a plurality of documents sets, said producing of each said set including:

outputting said separated rasterized image data from said job image buffer to provide output data;

altering said output data in accordance with an operator's adjustments;

subjecting said altered output data to a halftone process to generate halftone rendered data;

printing a document set from said halftone rendered data;

wherein said altering is in real-time during said printing of each of said sets.

Claim 52 is supported by the application as filed, in the same manner as Claim 48 and, in addition, by the language added to the specification from U.S. Patent No. 5,047,955. Claim 52 is allowable on the grounds discussed above in relation to Claim 48. Claim 52 also requires producing each of a plurality of documents sets, in which the producing of each set includes: outputting said separated rasterized image data from the buffer, altering that data and then subjecting that data to halftoning and then printing the altered and halftoned data. The altering of each of the sets in real-time during the printing of each of said sets. Rourke's requirement that "each time an editing operation is performed, revisions of the job copy buffered at the server must be updated appropriately." (Rourke, col. 12, lines 52-55; citation omitted) teaches against this feature of Claim 52, since the updated job master of Rourke incorporates edits and would not be re-edited for each additional set of documents.

Claim 46 is allowable as depending from Claim 52 and as follows. The rejection stated:

> "Regarding page 46: Rourke discloses that the RID is data that is not subsequently rerasterized prior to printing (column 13, lines 28-39 of Rourke). Once the print job is processed, the RID is delivered directly to the job integrator, and is printed immediately based solely upon the resultant RID (column 13 lines 28-39 of Rourke). Thus, the RID is data that is not subsequently rerasterized prior to printing."

Amended Claim 46 states:

> 46. The method of Claim 52, wherein said data is not rerasterized prior to said printing.

Claim 46 was amended to track the language of Claim 52 and was broadened. Claim 46 requires that the image data is not rerasterized. The cited portion of Rourke concerns a job integrator that delivers color prints using a conveyor system. (Rourke, col. 13, lines 28-30; see generally col. 13, lines 11-39)

The rejection stated as to Claim 27:

> "Regarding claim 27: Rourke discloses an apparatus (figure 2 of Rourke) for processing a digital image (figure 11 and column 12, lines 49-52 of Rourke) comprising:
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> "• a printer (figure 2(12-1) of Rourke) configured at least to print a print job (column 6, lines 45-48 of Rourke).
>
> "• a raster image processor (RIP) (figure l(25(portion)) and column 9, lines 24-26 of Rourke) configured at least to provide rasterized color separated contone gray level image data (RIP Data) (column 6, lines 48-54 and column 9, lines 51-56 of Rourke).

"• an image processor (figure 1(25(portion)) and column 9, lines 24-26 of Rourke) configured at least to:

"• alter the RIP Data in accordance with an operator's adjustments (figure 11(145) and column 12, lines 49-52 of Rourke), such that the altering occurs while a print job is being parsed, thereby resulting in a corresponding contemporaneous change in an appearance of the print job (figure 11(138,140) and column 12, lines 38-45 and lines 52-61 of Rourke).

"• subject the altered RIP Data to a halftone process to generate halftone rendered data (column 6, lines 48-54 and column 12, lines 34-37 of Rourke). Printers such as ink jet printers, laserjet printers, and digital copiers are used to print (column 6, lines 48-54 of Rourke) full color and pictoral image data (column 12, lines 34-37 of Rourke). Thus, halftone processing of the RIP Data to generate halftone rendered data is inherent.

"• output the halftone rendered data, or a derivative thereof, for subsequent printing (column 13, lines 28-39 of Rourke).

"The raster image processor (RIP) and image processor are both embodied in the server (figure 2(25) of Rourke) as portions of the physically-embodied software executed by the server to perform the corresponding tasks (column 9, lines 24-26 and lines 46-56 of Rourke).

"Rourke does not disclose expressly that the altering of the RIP Data occurs while the printer is specifically printing the print job.

"Barry discloses that parsing, RIPing and printing occur in an overlapping manner (figure 6 and column 10, lines 18-38 of Barry). Thus, as soon as one page or group of pages is ready to print the page or group of pages is printed while the page or group of pages to be printed afterwards is in the process of being parsed and RIPed.

"Rourke and Barry are combinable because they are from the same field of endeavor, namely high-volume distributed printing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print the page or group of pages immediately after the operations necessary for preparation are completed, thus performing the preparatory operations of later pages while the earlier pages are still in the process of actual printing, as taught by Barry. As applied to Rourke, the altering of the separated rasterized contone gray level image data would occur while the printer is printing the print job since, as soon as the parsing and editing is performed for a prior page or group of pages. the pages would be printed while the next page or group of pages is being parsed and edited. The motivation for doing so would have been that overlapping the preparatory operations with the printing operations in a print, job according to the teachings of Barry would increase the overall throughput of the printing system This is clearly a desirable result for the system of Rourke. In fact, Rourke places the print data in the job to be edited initially in a RIPed format to facilitate a print-on-demand system (column 9. lines 46-56 of Rourke). Applying the teachings of Barry to

Rourke further increases the speed and capacity of the print-on-demand system taught by Rourke. Therefore, it would have been obvious to combine Barry with Rourke to obtain the invention as specified in claim 27."

Claim 27 has been replaced by Claim 56, which states:

> 56. An image processing system comprising:
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> a raster image processor rasterizing image data of a print job having a plurality of document sets;
>
> a job image buffer storing said rasterized image data;
>
> a printer printing each of said document sets of said print job; and
>
> an image processor repeatedly receiving said rasterized image data from said job image buffer, changing said data in accordance with an operator's adjustments and halftoning said data, and then delivering said data to said printer for use in printing respective ones of said document sets.

Claim 56 is supported and allowable on the same grounds as Claim 52.

Claim 47 was cancelled.

Claims 14, 16, 19, 21, 28, 30 and 40-44 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rourke (US Patent 5,995,721) in view of Barry (US Patent 5,596,416) and Hayashi (US Patent 5,790,282). Claims 15, 20 and 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rourke (US Patent 5,995,721) in view of Barry (US Patent 5,596,416), Hayashi (US Patent 5,790,282), and Miller (US Patent 5,731,823).

Claims 14-16 were replaced by Claims 49-51, respectively, which are allowable as depending from Claim 48.

Claims 19-21 were replaced by Claims 53-55, respectively, which are allowable as depending from Claim 52.

Claims 28-30 were replaced by Claims 57-59, respectively, which are allowable as depending from Claim 56.

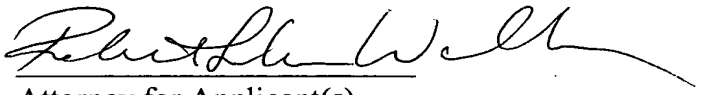
Claims 40-44 are allowable as depending from allowable claims: Claim 40 from 42, 41-42 from 52, and 43-44 from 56. Claims 40-44 were amended as needed to track the language of the respective parent claim. Claims 40-41 and 43 were broadened.

Quotations are presented above for convenience. Efforts have been made to ensure accuracy, but the quotations are not controlling over original language.

It is believed that these changes now make the claims clear and definite and, if there are any problems with these changes, Applicants' attorney would appreciate a telephone call.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,



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